

**Remarks**

Favorable reconsideration of this application, in view of the above amendments and in light of the following remarks and discussion, is respectfully requested.

Applicants respectfully request entry of this response, as the response places the application in clear condition for allowance, or alternatively at least places the claims in better form for appeal. Specifically, Applicants have amended each of the independent claims to overcome the outstanding rejection. Upon entry of this response, Claims 1-6 and 12-17 are pending; independent Claims 1 and 12-15 having been presently amended.

In the outstanding Office Action, Claims 1, 3, and 6 were rejected under 35 U.S.C. § 102(b) as being anticipated by Great Britain Publication No. 2 154 434 to Herdtle et al. (Herdtle). Claims 2, 4, 5, and 12-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Herdtle in view of U.S. Patent No. 5,132,038 to Kukanskis et al. (Kukanskis). Applicants respectfully assert that the amendments to the claims have overcome the rejections for the following reasons.

The present invention is directed to wet treatment methods useful in at least one of a chemical processing step and a rinsing step performed upon fabrication of semiconductor devices, as well as methods of treating a substrate. Independent Claim 1 recites that a substrate under treatment is treated with a desired liquid while causing the substrate to revolve around an axis of rotation outside the substrate such that the desired liquid flowing on a surface of the substrate is maintained flowing under a centrifugal force greater than gravitation. The surface of the substrate is disposed on a horizontal plane perpendicular to the axis of rotation. The substrate is treated while supplying a fresh liquid of the same kind as the desired liquid at a flow rate at least equal to a discharge rate of the desired liquid only in a direction perpendicular to the axis of rotation. Independent Claim 12 recites rotating the substrate about an axis disposed apart from the substrate. A surface of the substrate is disposed on a horizontal plane

perpendicular to the axis. A liquid to treat the surface of the substrate is supplied in a direction only perpendicular to the axis.

Herdtle is directed to a machine for washing circuit boards. As shown in Figure 2, for example, of Herdtle, a cleaning liquid is fed to a passage 120 and thus to spray nozzles 146. As shown in Figure 2, the spray nozzles 146 provide the cleaning liquid in a variety of directions. By this arrangement, the cleaning liquid can be distributed better over parts 37 of plate form, with the aim of an improved cleaning effect.<sup>1</sup>

However, Applicants respectfully assert that Herdtle does not teach or suggest the claimed features of a treated surface of a substrate disposed on a horizontal plane perpendicular to an axis about which the substrate is rotated, and supplying a liquid only perpendicular to the axis, as recited in independent Claims 1 and 12. Specifically, Applicants respectfully assert that Herdtle does not show or state that treated surfaces of the parts 37 are disposed on a horizontal plane perpendicular to an axis about which the parts 37 are rotated, for example. Further, Applicants respectfully assert that Herdtle does not show or state that the cleaning liquid is supplied only perpendicular to the axis, for example, but rather shows that the cleaning liquid is supplied in a variety of directions.

Applicants respectfully assert that the claimed methods recited in independent Claims 1 and 12 provide numerous advantages that are not provided by the machine for washing circuit boards of Herdtle. By way of specific non-limiting example, Applicants respectfully assert that the claimed methods recited in the independent claims can flow a layer directly contacting a substrate of a desired liquid by centrifugal force more effectively than the machine for washing circuit boards of Herdtle. Thus, Applicants respectfully assert that the claimed methods recited in independent Claims 1 and 12 can more promptly and effectively treat a substrate with a minimum amount of the desired liquid as compared to the machine of Herdtle. Rather, in the

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<sup>1</sup> From page 3, line 114 to page 4, line 4.

machine of Herdtle the cleaning liquid is under a centrifugal force and a gravity force, and the centrifugal force on the cleaning liquid directly contacting the circuit board is relatively weaker.

Specifically, independent Claim 1 recites “the surface of the substrate disposed on a horizontal plane perpendicular to the axis of rotation, and said substrate is treated while supplying a fresh liquid . . . only in a direction perpendicular to the axis of rotation.” Independent Claim 12 recites “a surface of the substrate disposed on a horizontal plane perpendicular to the axis . . . and supplying a liquid to treat the surface of the substrate in a direction only perpendicular to the axis.” Thus, Applicants respectfully request that the rejection of independent Claim 1 under 35 U.S.C. § 102(b) be withdrawn, and the independent claim allowed.

With regard to the rejection of independent Claim 12, the Office Action relies on Kukanskis to remedy the deficiencies of Herdtle. However, Applicants respectfully assert that Kukanskis also does not teach or suggest the claimed features recited in independent Claim 12.

Kukanskis is directed to a composition for preparing printed circuit through-holes for metallization. However, Applicants respectfully assert that Kukanskis does not teach or suggest the claimed features of a treated surface of a substrate disposed on a horizontal plane perpendicular to an axis about which the substrate is rotated, and supplying a liquid only perpendicular to the axis, as recited in independent Claim 12.

Thus, Applicants respectfully assert that neither Herdtle nor Kukanskis, whether taken alone or in combination, teaches or suggests the claimed features recited in independent Claim 12. Thus, Applicants respectfully request that the rejection of independent Claim 12 under 35 U.S.C. § 103(a) be withdrawn, and the independent claim allowed.

Dependent Claims 2-6 and 13-17 are allowable for at least the same reasons as independent Claims 1 and 12, from which they depend, as well as for their own features. Thus,

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Applicants respectfully request that the rejections of dependent Claims 2-6 and 13-17 under 35 U.S.C. §§ 102(b) and 103(a) be withdrawn, and the dependent claims allowed.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-6 and 12-17 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

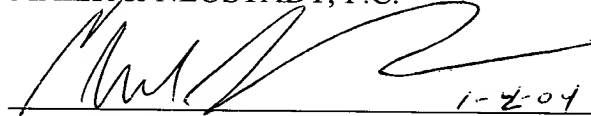
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Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Gregory J. Maier', is written over a horizontal line. To the right of the signature, the date '1-2-04' is handwritten.

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